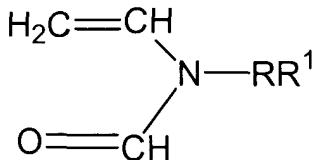


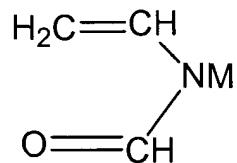
WHAT IS CLAIMED IS:

1. A method of synthesizing a compound having the formula:



comprising the step of:

reacting a N-vinylformamide salt having the formula



with a compound having the formula XRR^1 ; wherein X is Br, Cl or I, M is an alkali metal or an alkali earth metal, R^1 is a C0-C25 alkylene group, a C0-C25 fluoroalkylene group or a C0-C25 perfluoro alkylene group, R^2 is H, provided R^1 is not absent, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, an aryl group, a hydroxy group, a polyether group, a heterocyclic group of 5 or 6 atoms wherein at least one of the atoms is not a carbon and is N, O, or S, $-\text{OR}^3$, wherein, R^3 is an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, $-\text{C}(\text{O})\text{R}^4$, $-\text{C}(\text{O})\text{OR}^4$, $-\text{OC}(\text{O})\text{R}^4$, wherein R^4 is an H, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, a phthalimide group or NR^5R^5 wherein R^5 and R^5 are independently H, $-\text{C}(\text{O})\text{R}^4$, an alkyl, a fluoroalkyl group, a perfluoroalkyl group or an aryl group.

2. The method of claim 1 wherein the N-vinylformamide salt is formed by reacting an alkali metal base or an alkali earth metal base with N-vinylformamide.

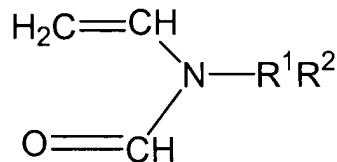
3. The method of claim 2 wherein the alkali metal base is *t*-BuOK and the N-vinylformamide salt is N-vinylformamide potassium salt.

4. The method of claim 1 wherein X is Br.

5. The method of claim 1 wherein R^1 is a C1-C10 alkylene group.

6. The method of claim 1 wherein R^2 is a C1-C10 alkyl group.

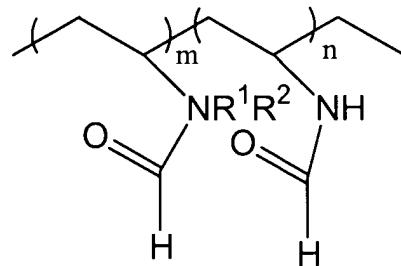
7. The method of claim 1 wherein R¹ is a C1-C10 perfluoroalkylene group.
8. The method of claim 1 wherein R² is a C1-C10 perfluoroalkyl group.
9. The method of claim 1 wherein R² is a phthalimide group.
10. The method of claim 1 wherein M is K or Na.
11. A method of synthesizing a copolymer comprising the step of reacting a compound having the formula:



with at least one vinyl compound having at least one vinyl group, wherein R¹ is a C0-C25 alkylene group, a C0-C25 fluroalkylene group or a C0-C25 perfluoro alkylene group, R² is H, provided R¹ is not absent, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, an aryl group, a hydroxy group, a polyether group, a heterocyclic group of 5 or 6 atoms wherein at least one of the atoms is not a carbon and is N, O, or S, -OR³, wherein, R³ is an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, -C(O)R⁴, -C(O)OR⁴, -OC(O)R⁴, wherein R⁴ is an H, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, a phthalimide group or NR⁵R⁵ wherein R⁵ and R⁵ are independently H, -C(O)R⁴, an alkyl, a fluoroalkyl group, a perfluoroalkyl group or an aryl group.

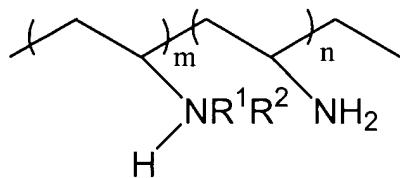
12. The method of claim 11 wherein the vinyl compound is N-vinylformamide.

13. The method of Claim 12 wherein the copolymer includes the following repeat units:



wherein m and n are integers.

14. The method of claim 13 further comprising the step of hydrolyzing the copolymer to form a copolymer having the repeat units:

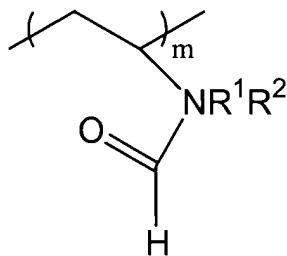


15. The method of Claim 14 wherein the hydrolysis occurs in acidic or basic conditions.

16. The method of claim 11 wherein the vinyl compound has the formula CH₂=CH-R⁶, wherein R⁶ is -OC(O)-CH₃, -C(O)-O-R⁷, wherein R⁷ is an alkyl group, or -C(O)OH.

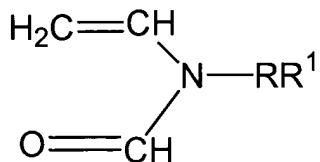
17. The method of claim 16 wherein R⁷ is a methyl group.

18. A polymer having the formula:

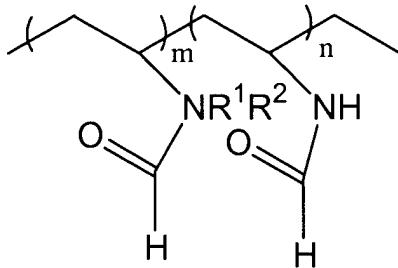


wherein m is an integer, R¹ is a C0-C25 alkylene group, a C0-C25 fluoroalkylene group or a C0-C25 perfluoro alkylene group, R² is H, provided R¹ is not absent, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, an aryl group, a hydroxy group, a polyether group, a heterocyclic group of 5 or 6 atoms wherein at least one of the atoms is not a carbon and is N, O, or S, -OR³, wherein, R³ is an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, -C(O)R⁴, -C(O)OR⁴, -OC(O)R⁴, wherein R⁴ is an H, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, a phthalimide group or NR⁵R⁵ wherein R⁵ and R⁵ are independently H, -C(O)R⁴, an alkyl, a fluoroalkyl group, a perfluoroalkyl group or an aryl group.

19. A copolymer produced by reaction of a compound having the formula:

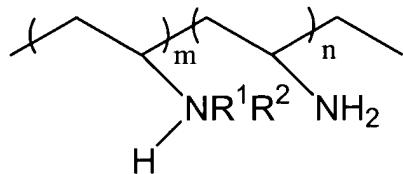


with N-vinylformamide, wherein the copolymer includes the following repeat units:

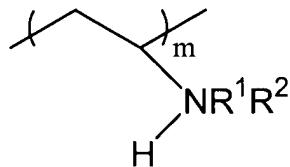


and wherein m and n are independently, integers, R¹ is a C0-C25 alkylene group, a C0-C25 fluroalkylene group or a C0-C25 perfluoro alkylene group, R² is H, provided R¹ is not absent, an alkyl group, a fluroalkyl group, a perfluoroalkyl group, an aryl group, a hydroxy group, a polyether group, a heterocyclic group of 5 or 6 atoms wherein at least one of the atoms is not a carbon and is N, O, or S, -OR³, wherein, R³ is an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, -C(O)R⁴, -C(O)OR⁴, -OC(O)R⁴, wherein R⁴ is an H, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, a phthalimide group or NR⁵R⁵ wherein R⁵ and R⁵ are independently H, -C(O)R⁴, an alkyl, a fluoroalkyl group, a perfluoroalkyl group or an aryl group.

20. The copolymer of Claim 18 wherein the copolymer is hydrolyzed to from a copolymer with the repeat units:



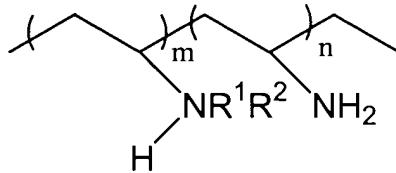
21. A polymer having the formula:



wherein m is an integer, R¹ is a C0-C25 alkylene group, a C0-C25 fluroalkylene group or a C0-C25 perfluoro alkylene group, R² is H, provided R¹ is not absent, an alkyl group, a fluroalkyl group, a perfluoroalkyl group, an aryl group, a hydroxy group, a polyether group, a heterocyclic group of 5 or 6 atoms wherein at least one of the atoms is not a carbon and is N, O, or S, -OR³, wherein, R³ is an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, -C(O)R⁴, -C(O)OR⁴, -OC(O)R⁴, wherein R⁴ is an H, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, a phthalimide group or NR⁵R⁵

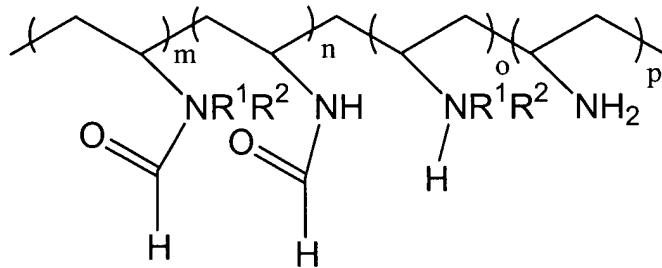
wherein R⁵ and R⁵ are independently H, -C(O)R⁴, an alkyl, a fluoroalkyl group, a perfluoroalkyl group or an aryl group.

22. A polymer having the formula:



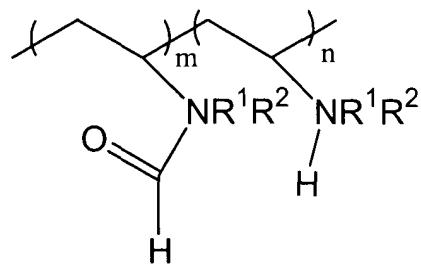
wherein m is an integer, R¹ is a C0-C25 alkylene group, a C0-C25 fluoroalkylene group or a C0-C25 perfluoro alkylene group, R² is H, provided R¹ is not absent, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, an aryl group, a hydroxy group, a polyether group, a heterocyclic group of 5 or 6 atoms wherein at least one of the atoms is not a carbon and is N, O, or S, -OR³, wherein, R³ is an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, -C(O)R⁴, -C(O)OR⁴, -OC(O)R⁴, wherein R⁴ is an H, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, a phthalimide group or NR⁵R⁵ wherein R⁵ and R⁵ are independently H, -C(O)R⁴, an alkyl, a fluoroalkyl group, a perfluoroalkyl group or an aryl group, the polymer having end groups that are either .

23. A random copolymer including the following repeat units:



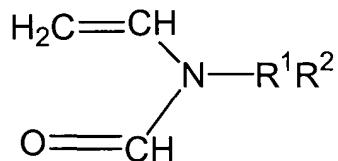
and wherein m, n, o and p are independently, integers, R¹ is a C0-C25 alkylene group, a C0-C25 fluoroalkylene group or a C0-C25 perfluoro alkylene group, R² is H, provided R¹ is not absent, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, an aryl group, a hydroxy group, a polyether group, a heterocyclic group of 5 or 6 atoms wherein at least one of the atoms is not a carbon and is N, O, or S, -OR³, wherein, R³ is an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, -C(O)R⁴, -C(O)OR⁴, -OC(O)R⁴, wherein R⁴ is an H, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, a phthalimide group or NR⁵R⁵ wherein R⁵ and R⁵ are independently H, -C(O)R⁴, an alkyl, a fluoroalkyl group, a perfluoroalkyl group or an aryl group.

24. A polymer including the following repeat units:



and wherein m and n are independently, integers, R¹ is a C0-C25 alkylene group, a C0-C25 fluoroalkylene group or a C0-C25 perfluoro alkylene group, R² is H, provided R¹ is not absent, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, an aryl group, a hydroxy group, a polyether group, a heterocyclic group of 5 or 6 atoms wherein at least one of the atoms is not a carbon and is N, O, or S, -OR³, wherein, R³ is an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, -C(O)R⁴, -C(O)OR⁴, -OC(O)R⁴, wherein R⁴ is an H, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, a phthalimide group or NR⁵R⁵ wherein R⁵ and R⁵ are independently H, -C(O)R⁴, an alkyl, a fluoroalkyl group, a perfluoroalkyl group or an aryl group.

25. A compound having the formula:



wherein R¹ is a C0-C25 alkylene group, a C0-C25 fluoroalkylene group or a C0-C25 perfluoro alkylene group, R² is H, provided R¹ is not absent, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, an aryl group, a hydroxy group, a polyether group, a heterocyclic group of 5 or 6 atoms wherein at least one of the atoms is not a carbon and is N, O, or S, -OR³, wherein, R³ is an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, -C(O)R⁴, -C(O)OR⁴, -OC(O)R⁴, wherein R⁴ is an H, an alkyl group, a fluoroalkyl group, a perfluoroalkyl group, or an aryl group, a phthalimide group or NR⁵R⁵ wherein R⁵ and R⁵ are independently H, -C(O)R⁴, an alkyl, a fluoroalkyl group, a perfluoroalkyl group or an aryl group.

26. The compound of claim 25 wherein X is Br.

27. The compound of claim 25 wherein R¹ is a C1-C10 alkylene group.

28. The compound of claim 25 wherein R² is a C1-C10 alkyl group.

29. The compound of claim 25 wherein R¹ is a C1-C10 perfluoroalkylene group.
30. The compound of claim 25 wherein R² is a C1-C10 perfluoroalkyl group.
31. The compound of claim 25 wherein R² is a phthalimide group.